

What is Claimed is:

1. A microlens fabrication method comprising the following steps of:

5 (a) forming a first layer of a predetermined etching rate;

(b) forming a second layer on the first layer, the second layer having a predetermined etching rate different from that of the first layer;

10 (c) forming a mask pattern in use for etching on the second layer; and

(d) etching the first and second layers to form a non-spherical lens contour therein.

2. The microlens fabrication method according to claim 15 1, wherein the etching step (d) comprises isotropic etching.

3. The microlens fabrication method according to claim 1, wherein the etching rate of the first layer is lower than that of the second layer.

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4. The microlens fabrication method according to claim 3, wherein the second layer is etched more rapidly than the first layer.

25 5. The microlens fabrication method according to claim

4, further comprising the step of (e) heat-treating the first layer to lower the etching rate of the first layer after the first layer-forming step (a).

5 6. The microlens fabrication method according to claim 5, wherein each of the first and second layers is made of a material selected from a group including polymer, silica, silicon and metal.

10 7. The microlens fabrication method according to claim 4, wherein the first and second layers are doped so that the doping concentration of the first layer is larger than that of the second layer.

15 8. The microlens fabrication method according to claim 7, wherein the first and second layers are made of silica.

 9. The microlens fabrication method according to claim 1, wherein the second layer is deposited on an upper face of
20 the first layer.

 10. The microlens fabrication method according to claim 1, further comprising the step of (f) filling molding material into the lens contour in the first and second layers by using
25 the lens contour as a mold so as to form a microlens.

11. A microlens fabrication method, comprising the following steps of:

(a) forming at least two layers having their own etching rates different from one another;

5 (b) forming an etching mask pattern on the at least two layers; and

(c) etching the at least two layers to form a non-spherical lens contour therein.

10 12. The microlens fabrication method according to claim 11, wherein the etching step (c) comprises isotropic etching.

13. The microlens fabrication method according to claim 11, wherein an upper one of the layers has a higher etching rate
15 than a lower one.

14. The microlens fabrication method according to claim 13, wherein an upper one of the layers has a higher horizontal etching rate than a lower one.

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15. The microlens fabrication method according to claim 14, further comprising the step of (d) heat treating a layer structure following the formation of each one of the layers to lower the etching rate of each existing layer.

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16. The microlens fabrication method according to claim 15, wherein each of the layers is made of a material selected from a group including polymer, silica, silicon and metal.

5 17. The microlens fabrication method according to claim 14, wherein a lower one of the layers has a higher doping concentration than a higher one overlying the lower layer.

18. The microlens fabrication method according to claim 10 17, wherein the layers are made of silica.

19. The microlens fabrication method according to claim 11, wherein a higher one of the layers is deposited on a top surface of a lower one.

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20. The microlens fabrication method according to claim 11, further comprising the step of (e) filling molding material into the lens contour in the layers by using the lens contour as a mold so as to form a microlens.

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